Call for Membership SETAC WG-MES

Sustainability Evaluation: Diverging routes recombined?

Tasks for a new Working Group on Modelling and Evaluation for Sustainability

Gjalt Huppes[1] and Masanobu Ishikawa[2]

[1] Institute of Environmental Sciences (CML), Leiden University, PO Box 9518, 2300 RA Leiden, Netherlands (huppes@cml.leidenuniv.nl)
[2] Graduate School of Economics, Kobe University, 2-1 Rokkodai-cho, Nada-ku, Kobe, 657-8501, Japan (ishikawa@econ.kobe-u.ac.jp)

DOI: http://dx.doi.org/10.1065/lca2006.12.293

Striving for sustainability, who could be opposed to such a well respected goal? Nobody of course, but agreement on action is not following directly. There are two fundamental reasons why such agreement does not follow from the goal. One is that the sustainability is a composite goal, involving the three pillars and within each pillar many relevant goals again. The multitude of relevant issues are to be combined in practical decision making, somehow based on priorities and trade-offs. The second reason is that insight in empirical relations is limited and conditional. Combining the two, modelling and evaluation of specific actions can lead to fundamentally conflicting outcomes. One may love biofuel for climate reasons or hate it for biodiversity reasons, which require a land use model not present and not fitting in most sustainability models now. Is that all we can say, and leave what will happen to the dynamics of social and political discourse? That is what is currently happening. There are at least four domains of analysis (see Huppes and Ishikawa 2005), all legitimate of course, which have their own sustainability discourses. They are hardly connected and result in conflicting outcomes in a practical sense. Boundaries may not be sharp but here the four are, in arbitrary order, and with exemplary references.

1. Industrial ecology approaches with a mass orientation, as in MFA and SFA (Brunner and Rechberger 2003).
2. Technology oriented life cycle approaches, exemplified in ISO-LCA and EIOA (ISO14044 2006, Tukker et al. 2006, Huppes et al. 2006, Leontief 1970).
3. Main stream economists taking into account market relations, exemplified in CBA and CGE modelling (Barbier et al. 1990, Eshet et al. 2006, E3ME web, GEM-E3 web).
4. Ecological economists, refraining from general approaches, focussing at multi-criteria analysis at a case level, and therefore lacking an acronym (Martinez-Alier et al. 1998).

The approach chosen to a substantial degree determines what is sustainable. Established policy aims like reducing resource use and preventing waste come from the mass oriented approach. In Asia the 3R (Reduce, Reuse, and Recycle) comes from the same background. Technology regulation is often based on life cycle analysis, focussing on emissions and primary resource extraction. Policies especially in the energy and waste domain often are based on CBA and CGE models. Ecological economic approaches tend to be case specific, focussing on multi-criteria analysis or link to the other approaches in a more reflexive manner. Cross-boundary options of course exist, like economists linking willingness-to-pay measures to LCA outcomes (Rabl et al. 2004), and industrial ecologists linking LCA-type analysis to materials use (Van der Voet et al. 2005). These approaches not only differ in terms of the values placed central, as goal variables in their models, but also in the empirical part of the analysis. Basic differences are in terms of time-independent static models, like steady state LCA models; quasi-dynamic models specified 'by hand', like most CBA models; and time-dependent dynamic models, like CGE models, and with MFA and EcolEcon models functioning at all three levels. The empirical and the evaluative part of modelling of course are intertwined. It is not possible to discount future effects in a steady state model, to give an obvious example.

It will never be possible to align everybody on the same goals, let alone the same priorities between them. Nor will there be a single model covering all empirical relations. What will be possible we think is to clarify the relations between these overlapping approaches, and in so doing advance the science and the practice of sustainability. How might this be brought about?

SETAC has set up a working group on this subject, the Working Group on Modelling and Evaluation for Sustainability, WG-MES. This working group is in the start-up phase now. The intention is that participation will at least cover these four main domains of sustainability analysis. An Advisory Board with this broad coverage is being set up at the moment while broader institutional linkage is prepared for as well, especially to UNEP-TIE, the SCP programme and to the ongoing work in Eco-Efficiency Analysis. A further description is at the WG-MES website, see below. The working group will meet physically at occasions organised in connection with other events. The first meeting will be at the SETAC-Europe conference in Porto, 24 May 2007; the second will be following the Industrial Ecology Conference in Toronto at 21 June 2007. This meeting will partly be combined with the *International Workshop on Eco-Efficiency – Foundations for trade-offs in practical decision making*, which has an overlapping subject. An Asian meeting is planned for in fall. For a project description, further events, and in due time upcoming documents please consult the WG-MES website: http://www.wg-mes.com/. Membership is open and possible at two levels, active participation or agenda membership. Please indicate your background and subject of interest to info@wg-mes.com.

References

Barbier E, Markandya A, Pearce DW (1990): Environmental sustainability and CBA. Environment and Planning A, 22, 1259–1266
Brunner PH, Rechberger H (2003): Practical Handbook of Material Flow Analysis. Taylor & Francis/CRC, London
E3ME web: See <http://www.camecon.com/e3me/e3me_model.htm>
Eshet T, Ayalon O, Shechter M (2006): An inclusive comparative review of valuation methods for assessing environmental goods and externalities. International Journal of Business Environment 1 (2) 190–210
GEM-E3 web: See <http://www.gem-e3.net>
Huppes G, Ishikawa M (2005): A framework for quantified eco-efficiency analysis. Journal of Industrial Ecology 9 (4) 25–41
Huppes G, Suh S, Heijungs R, van Oers L, Nielsen P, Guinée JB (2006): Environmental Impacts of Consumption in the European Union: High-Resolution Input-Output Tables with Detailed Environmental Extensions. Journal of Industrial Ecology 10 (3) 129–146
ISO 14044 (2006): Environmental management – Life cycle assessment – Requirements and guidelines. International Organization for Standardization, Geneva
Leontief W (1970): Environmental Repercussions and the Economic Structure: An Input-Output Approach. Review of Economics and Statistics 52 (3) 262–271
Martinez-Alier J, Munda G, O'Neill J (1998): Weak comparability of values as a foundation for ecological economics. Ecological Economics 26, 277–286
Rabl A et al. (2004): ExternE-Pol. Externalities of Energy: Extension of accounting framework and Policy Applications. Final Report contract N° ENG1-CT2002-00609. EC DG Research
Tukker A, Eder P, Suh S (2006): Environmental Impacts of Products: Policy Relevant Information and Data Challenges. Journal of Industrial Ecology 10 (3) 183–198
Van der Voet E, Van Oers L, Moll S, Schütz H, Bringezu S, de Bruyn S, Sevenster M, Warringa G (2005): Policy Review on Decoupling: Development of indicators to assess decoupling of economic development and environmental pressure in the EU-25 and AC-3 countries. Commissioned by European Commission, DG Environment. European Commission, Brussels, <http://ec.europa.eu/environment/natres/pdf/fin_rep_natres.pdf>